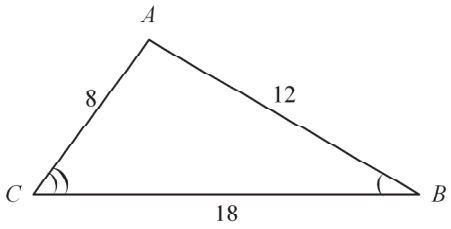
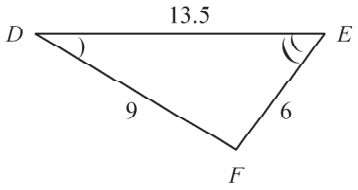
Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Geometry Second Semester Review

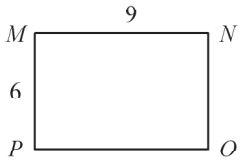
Short Answer

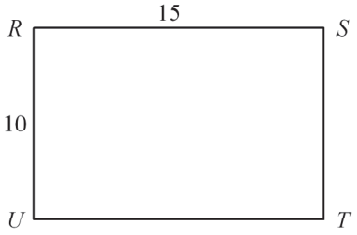
1. Identify the pairs of congruent angles and corresponding sides.





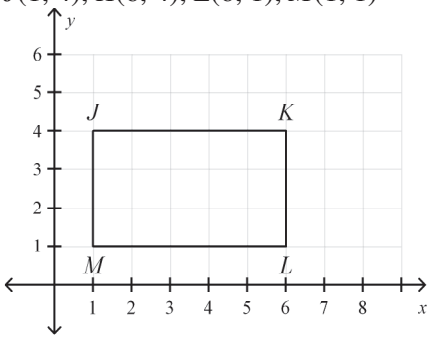
2. Determine whether the rectangles are similar. If so, write the similarity ratio and a similarity statement.



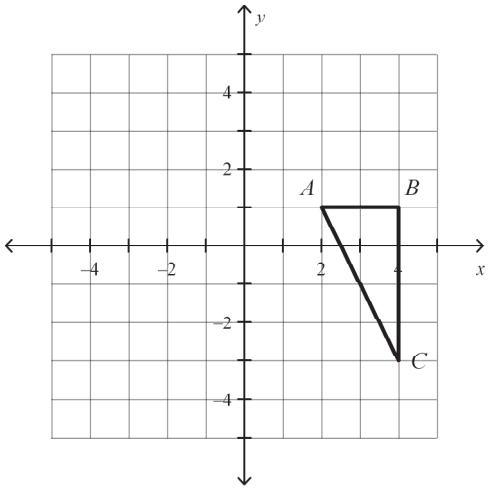


3. A video game designer is modeling a tower that is 320 ft high and 260 ft wide. She creates a model so that the similarity ratio of the model to the tower is $\frac{1}{500}$. What is the height and the width of the model in inches?

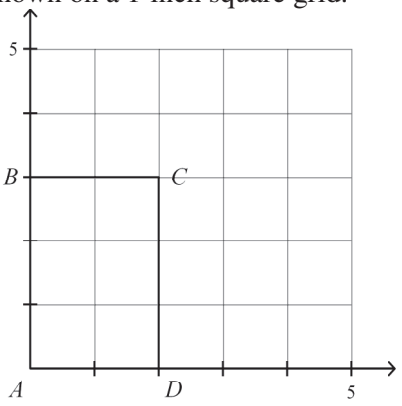
4. Apply the dilation D to the polygon with the given vertices. Name the coordinates of the image points.
$D: (x, y) \rightarrow (3x, 3y)$
$J(1, 4)$, $K(6, 4)$, $L(6, 1)$, $M(1, 1)$



5. Apply the dilation D to the polygon with the given vertices. Name the coordinates of the image points. Identify and describe the transformation.
   $D: (x, y) \rightarrow (4x, 4y)$
   $A(2, 1)$, $B(4, 1)$, $C(4, -3)$

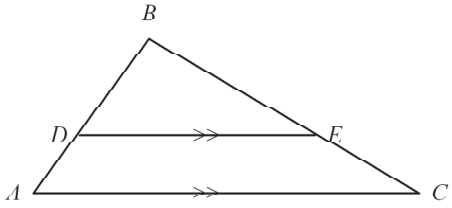


6. Tamika is resizing a photograph with a height of 3 inches and a width of 2 inches.The original photo $ABCD$ is shown on a 1-inch square grid.

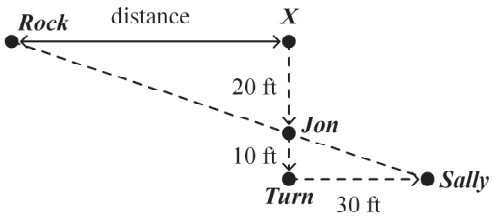


   Show the image, $A'B'C'D'$, on the grid after a dilation with scale factor $\frac{2}{3}$.

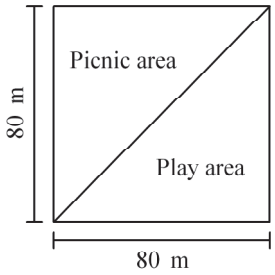
7. Explain why the triangles are similar and write a similarity statement.



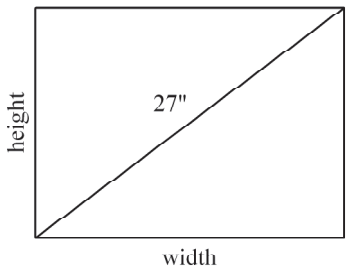
8. To find out how wide a river is, Jon and Sally mark an *X* at the spot directly across from a big rock on the other side of the river. Then they walk in a straight line along the river, perpendicular to the straight line between the *X* and the rock. After walking for 20 feet Jon stops while Sally continues along the straight line for another 10 feet. Then she makes a 90 degree turn and walks for 30 feet. When she stops and looks at the rock she sees that the straight line from her to the rock passes through Jon. What is the distance from *X* to the rock?



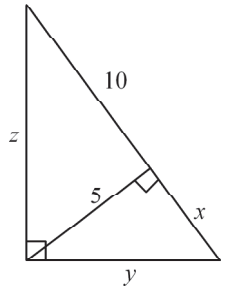
9. A community is building a square park with sides that measure 80 meters. To separate the picnic area from the play area, the park is split by a diagonal line from opposite corners. Determine the approximate length of the diagonal line that splits the square. If necessary, round your answer to the nearest meter.



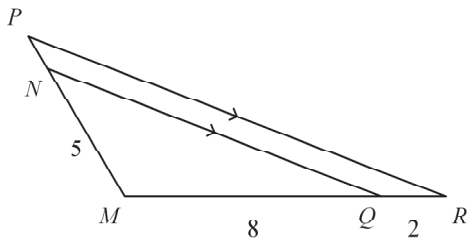
10. The size of a TV screen is given by the length of its diagonal. The screen aspect ratio is the ratio of its width to its height. The screen aspect ratio of a standard TV screen is 4:3. What are the width and height of a 27" TV screen? Round your answers to the nearest tenth of an inch.



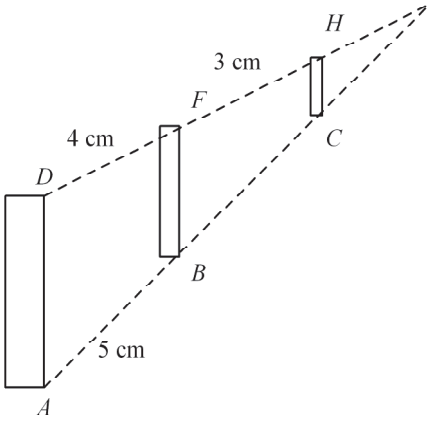
11. Find x, y, and z. Give your answers in simplest radical form.



12. Find NP.

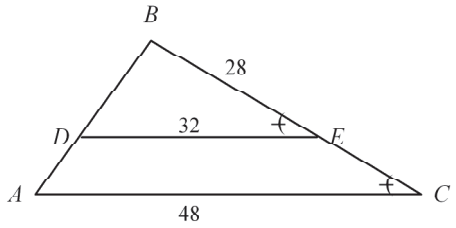


13. An artist used perspective to draw guidelines in her picture of a row of parallel buildings. How many centimeters is it from Point B to Point C?



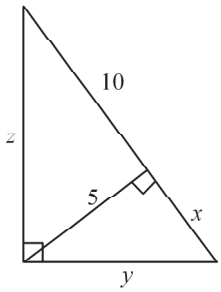
14. A tree is standing next to a 40-foot high building. The tree has an 18-foot shadow, while the building has a 16-foot shadow. How tall is the tree, rounded to the nearest foot?

15. Explain why $\Delta ABC \sim \Delta DBE$ and then find BC.

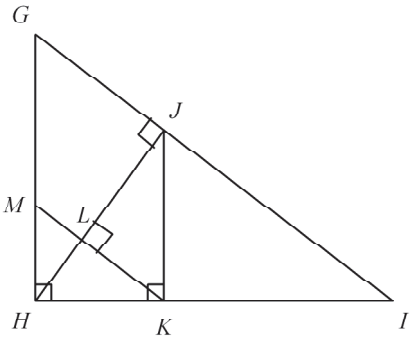


16. Find the geometric mean of the pair of numbers 2 and 8.

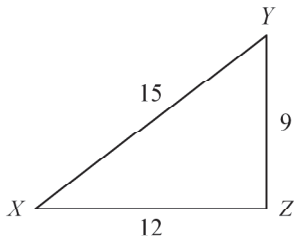
17. Find x, y, and z.



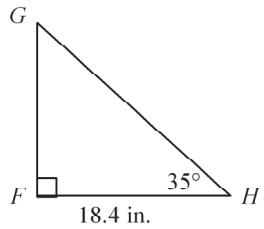
18. Find GI and GH to the nearest hundredth. LK is 3.20 cm and LJ is 3.67 cm.



19. Write the trigonometric ratio for cos X as a fraction and as a decimal rounded to the nearest hundredth.

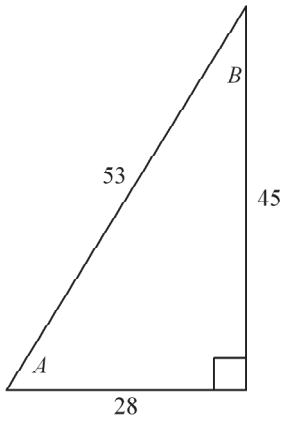


20. Find GH. Round to the nearest hundredth.

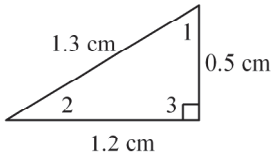


21. Jessie is building a ramp for loading motorcycles onto a trailer. The trailer is 2.8 feet off of the ground. To avoid making it too difficult to push a motorcycle up the ramp, Jessie decides to make the angle between the ramp and the ground 15°. To the nearest hundredth of a foot, find the length of the ramp.

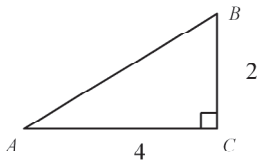
22. Find the sine and cosine of the acute angles in the right triangle.



23. Use the trigonometric ratio $\sin A = 0.38$ to determine which angle of the triangle is $\angle A$.



24. Find $\sin \angle A$ to the nearest hundredth.



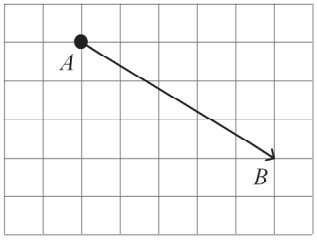
25. Some mountains in the Alps are very steep and have a grade of 42.7%. To the nearest degree, what angle do these mountains make with a horizontal line?

26. The largest Egyptian pyramid is 146.5 m high. When Rowena stands far away from the pyramid, her line of sight to the top of the pyramid forms an angle of elevation of 20° with the ground. What is the horizontal distance between the center of the pyramid and Rowena? Round to the nearest meter.

27. An eagle 300 feet in the air spots its prey on the ground. The angle of depression to its prey is 15°. What is the horizontal distance between the eagle and its prey? Round to the nearest foot.

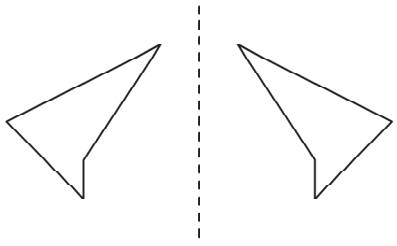
28. A pilot flying at an altitude of 1.8 km sights the runway directly in front of her. The angle of depression to the beginning of the runway is 31°. The angle of depression to the end of the runway is 23°. What is the length of the runway? Round to the nearest tenth of a kilometer.

29. Write the vector $\overrightarrow{AB}$ in component form.

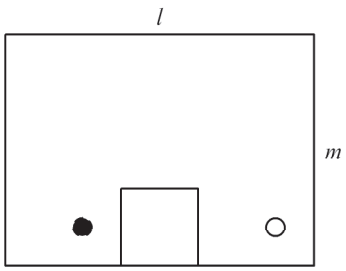


30. Draw the vector $\langle 6, -3 \rangle$ on the coordinate plane. Find its magnitude to the nearest tenth.

31. Tell whether the transformation appears to be a reflection. Explain.

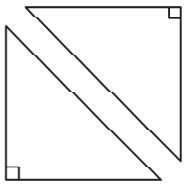


32. In miniature golf, Sarai wants to hit the golf ball (white circle) into the hole (black circle). She wants to accomplish this in one stroke, as easily as possible. Which statement best describes what she should do?

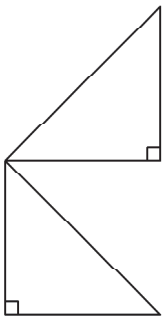


33. Find the coordinates of the image of the point $(-5, 7)$ when it is reflected across the line $y = 11$.

34. Tell whether the transformation appears to be a translation. Explain.



35. Tell whether the transformation appears to be a translation. Explain.



36. Translate the triangle with vertices $A(3, 4), B(2, -1)$, and $C(4, 12)$ along the vector $\langle -1, 3 \rangle$. Find the coordinates of the new image.

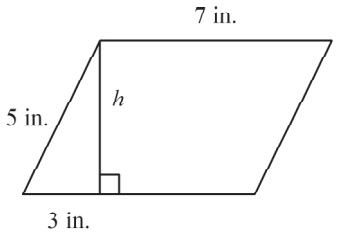
37. Tell whether the transformation appears to be a rotation. Explain.

38. Rotate ΔRSQ with vertices $R(4, -1)$, $S(5, 3)$, and $Q(3, 1)$ by 90° about the origin.

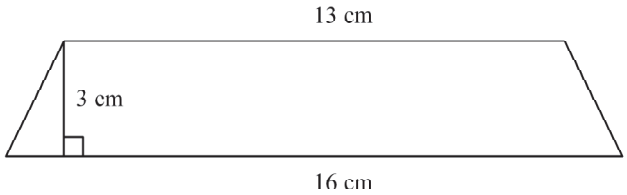
39. ΔABC has vertices $A(3, 1)$, $B(4, 5)$, and $C(2, 3)$. Rotate ΔABC 90° counterclockwise about the origin and then reflect it across the x-axis.

40. On a sketch of a mural, 3 inches represents one foot in the mural. A door in the sketch is 2 inches wide by 5 inches high. What is the perimeter of the door in the mural expressed in inches?

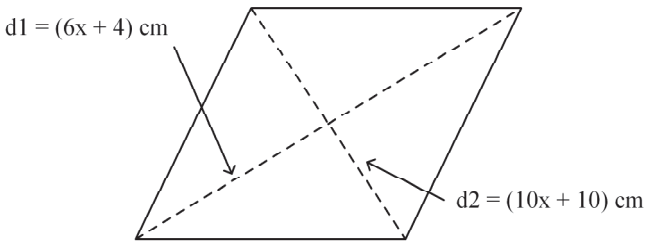
41. Find the area of the parallelogram.



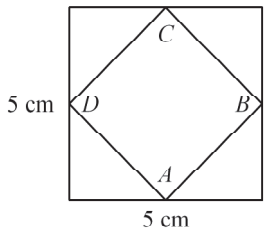
42. Find the area of a trapezoid, in which $b_1 = 13\,\text{cm}, b_2 = 16\,\text{cm}$, and $h = 3\,\text{cm}$.



43. Find the area of the rhombus.

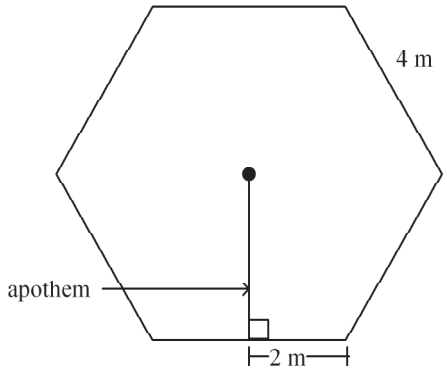


44. The vertices of square *ABCD* are the midpoints of the sides of a larger square. Find the perimeter and the area of square *ABCD*. Round to the nearest hundredth.

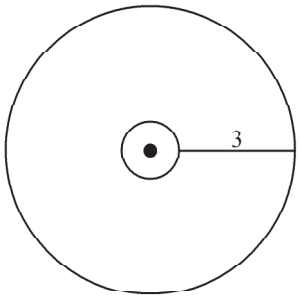


45. A store sells circular rugs in three different sizes. The rugs come in diameters of 8 ft, 12 ft, and 16 ft. Find the areas of the three different sizes of rugs. Use 3.14 for π and round answers to the nearest tenth.

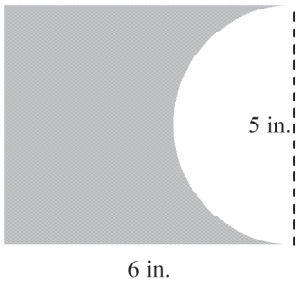
46. Find the area of a regular hexagon with side length 4 m. Round to the nearest tenth.



47. Two circles have the same center. The radius of the larger circle is 3 units longer than the radius of the smaller circle. Find the difference in the circumferences of the two circles. Round to the nearest hundredth.

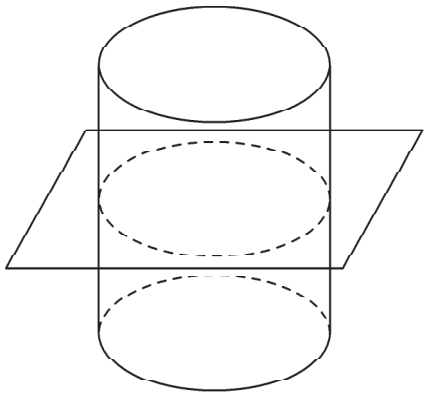


48. Find the shaded area. Round to the nearest tenth.



49. The base length of the triangle with vertices $A(1, 1), B(9, 1)$, and $C(5, 5)$ is multiplied by 2. Describe the effect of change on the area.

50. Describe the cross section.

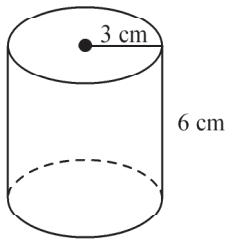


51. Find the volume of a right rectangular prism with length 12 in., width 10 in., and height 6 in. Round to the nearest tenth, if necessary.

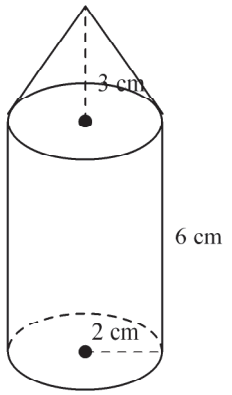
52. A fish tank is in the shape of a rectangular prism. The height of the tank is 18 in. The width of the tank is 17 in. The length of the tank is 38 in. Find the amount of water the tank can hold to the nearest gallon. (*Hint*: 1 gallon ≈ 0.134 ft^3.)

53. Find the volume of a cylinder with a base area of 25π in^2 and height equal to the radius. Give your answer both in terms of π and rounded to the nearest tenth.

54. The radius and height of the cylinder are multiplied by 4. Describe the effect on the volume.



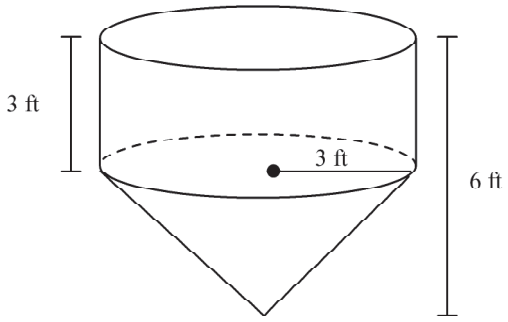
55. Find the volume of the composite figure. Round to the nearest tenth. (*Hint*: Volume of a cone is $V = \frac{1}{3}\pi r^2 h$.)



56. Find the volume of a rectangular pyramid with length 11 m, width 7 m, and height 8 m. Round to the nearest tenth, if necessary.

57. The base area of a model square pyramid is 1,000 sq ft. The height of the pyramid is 100 ft. Find the volume of the pyramid in cubic feet. Round to the nearest cubic foot.

58. Find the volume of the composite figure. Round to the nearest hundredth.

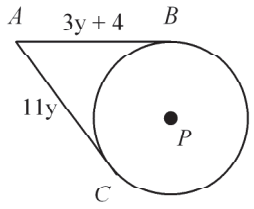


59. Find the diameter of a sphere with volume 972π in^3.

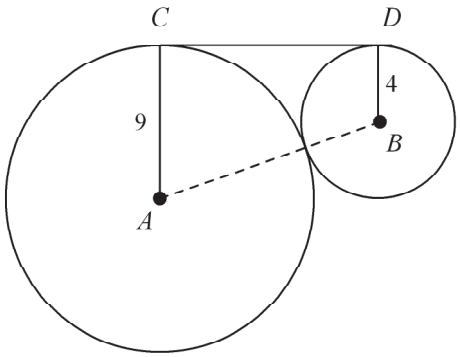
60. Find the volume of a sphere with diameter 30 ft. Give your answer in terms of π.

61. Find the surface area of a sphere with volume 288π m^3. Give your answer in terms of π.

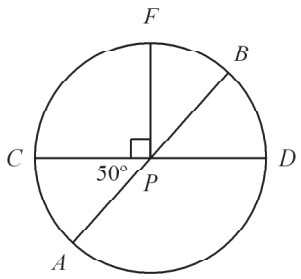
62. $\overline{AB}$ and $\overline{AC}$ are tangent to $\odot$P. Find AB.



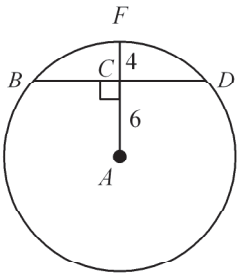
63. $\odot A$ has radius 9, $\odot B$ has radius 4, and $\overline{CD}$ is a common tangent. What is CD? (*Hint*: Draw a perpendicular segment $\overline{BE}$ from B to $\overline{AC}$.)



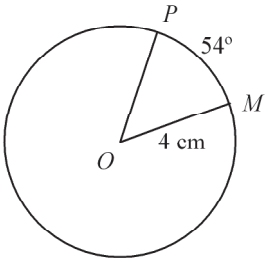
64. Find m$\overset{\frown}{CFB}$.



65. Find *BD*.

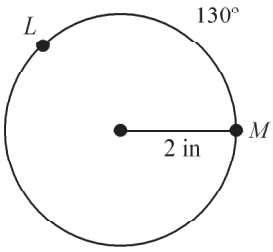


66. Find the area of sector *POM*. Give your answer in terms of π.

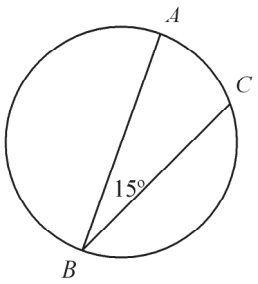


67. Jenny's birthday cake is circular and has a 30 cm radius. Her slice creates an arc with a central angle of 120°. What is the area of Jenny's slice of cake? Give your answer in terms of π.

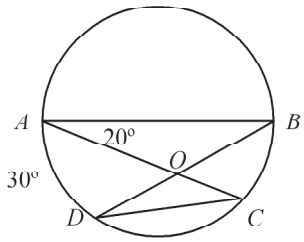
68. Find the arc length of an arc with measure 130° in a circle with radius 2 in. Round to the nearest tenth.



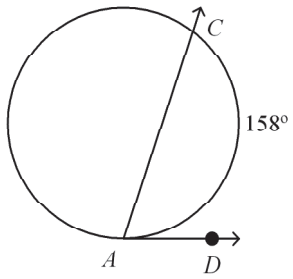
69. Find m$\overset{\frown}{AC}$.



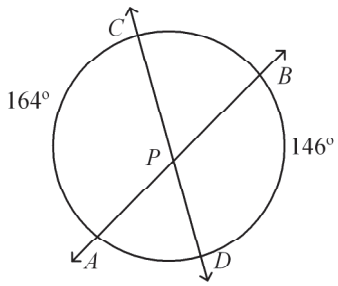
70. A wheel from a motor has springs arranged as in the figure. Find m$\angle DOC$.



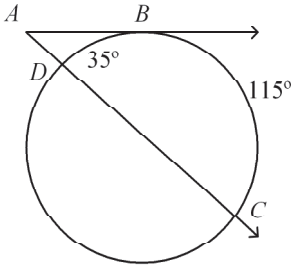
71. Find m$\angle CAD$.



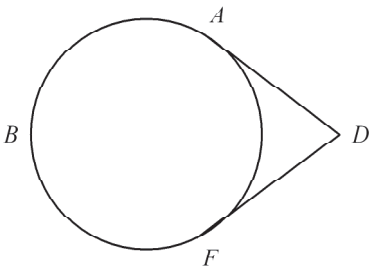
72. Find m$\angle BPD$.



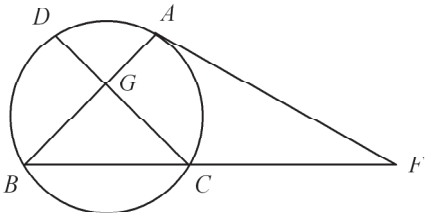
73. Find m$\angle A$.



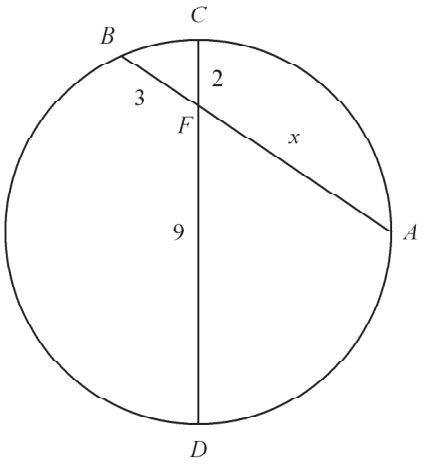
74. Two of the muscles that control eye movement are attached to the eyeball and intersect behind the eye as shown. If m(arc)$ABF = 300°$, what is m$\angle ADF$?



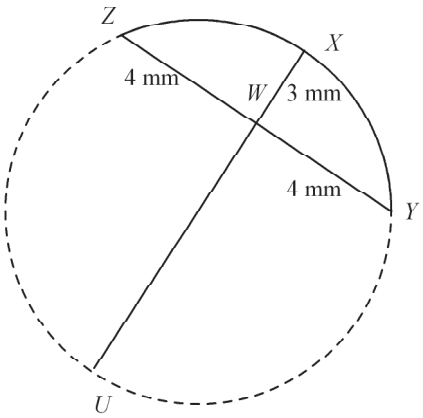
75. Given m$\angle AFB = 25°$, m$\angle BAF = 105°$, and m$\angle AGD = 86°$, find m$\overset{\frown}{AC}$.



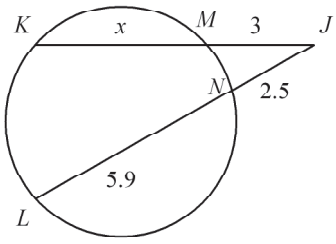
76. Find the value of x and the length of each chord.



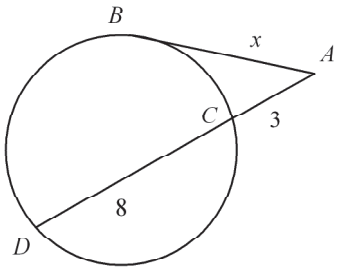
77. Archaeologists found a piece of an old coin. To calculate its original diameter, they drew a chord $\overline{XU}$ and its perpendicular bisector $\overline{ZY}$. Find the coin's diameter.



78. Find the value of x and the length of each secant segment.



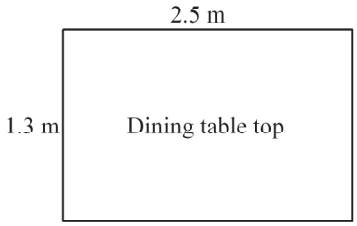
79. Find the value of x. Round to the nearest hundredth.

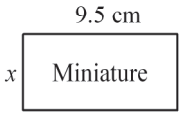


80. Write the equation of a circle with center $M(7, -10)$ and radius 2.

81. Graph the equation $(x-3)^2 + (y+2)^2 = 25$.

82. Maya is making a miniature dinner table for her little sister. She wants the table top to be similar to their real dinner table top. Find the width of the miniature table top to the nearest tenth of a centimeter.





83. $\overline{WX} \cong \overline{YZ}$. Find m$\overset{\frown}{WX}$.